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An International Perspective

Edited by Zvi Bodie, Olivia S. Mitchell, and John A. Turner

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Pensions in Emerging Economies

Chapter 5

Mandatory Saving Schemes: Are They an Answer to the Old Age Security Problem?

Estelle James and Dimitri Vittas

As the world's population ages, old age security systems are being reevaluated. This chapter is part of and draws heavily from a broader study (World Bank 1994) that analyzes alternative methods of providing old age security, with an emphasis on developing countries. One important model is the mandatory retirement saving scheme. These schemes are motivated by the belief that some people will not save on a voluntary basis when they are young because they are shortsighted or lack reliable savings instruments. From the perspective of old age they may wish they had saved more (time inconsistent preferences) or may become a charge upon the rest of society (moral hazard). Mandatory saving schemes avert these problems by forcing people to shift consumption from their earlier to their later years and by providing financial institutions for this purpose.

Their basic mode of operation is as follows. Workers' contributions are deposited in personal accounts, and benefits depend on these contributions plus the investment income they earn. These schemes are thus fully funded defined contribution plans not sponsored or differentiated by employer. In their purest form, mandatory retirement saving schemes imply no redistribution; the capital accumulation before retirement equals the present value of expected post-retirement income.

Full funding implies capital accumulation, and a key question is how these funds are managed and invested. In most mandatory saving schemes currently operating, the government determines the use of the funds and sets the rate of return. Examples of such "national provident funds" are found in Singapore, Malaysia, and several African countries. These centrally managed plans can involve capital and labor market distortions and capricious redistributions similar to those in many pub-

lic defined benefit plans, because required contribution rates may be high and returns low and uneven. As an alternative, mandatory saving schemes may be privately and competitively managed, in which case they are likely to have fewer distortion effects, fewer incentives for evasion, and less political manipulation. At this point Chile is the only country that has fully implemented a decentralized mandatory saving scheme, but several other Latin American countries are in the process of introducing one.

Like funded occupational plans, mandatory saving schemes can foster long-term saving and capital market development. But unlike defined benefit occupational schemes, they are fully funded by nature rather than by regulation. Their coverage can be broad. They do not imply portability problems or inhibit labor mobility. They permit workers to diversify risk. And unlike defined contribution occupational schemes, they allow workers, who bear the investments risk, to choose the investment manager.

Mandatory saving nevertheless creates a new set of problems. Most notably, privately managed schemes fail to insure workers against poor investment performance of the funds, a problem especially great where many workers have had little financial experience or information. In addition, they do not assist workers with low lifetime incomes or provide adequate pensions in the start-up years of the plan. For these reasons, a decentralized mandatory saving scheme requires a regulatory structure that protects workers against ill-informed investment choices. And it must be supplemented by a redistributive public plan that alleviates poverty. Three central dilemmas are posed:

(1) If mandatory schemes are imposed because of myopia among workers, how can we count on these same workers to make wise investments decisions?
(2) If governments have mismanaged their centrally administered pension plans, how can we count on them to regulate private funds effectively?
(3) If government regulates and guarantees, won't it eventually end up either controlling or bailing out these funds?

This chapter begins with a brief history of mandatory saving schemes, followed by a summary of their major design features. Theoretical and empirical evidence about their effects on the broader economy includes discussion of labor market, capital market, government fiscal stability, and the income distribution effects. In some cases we contrast these effects with those of the more common pay-as-you-go publicly managed systems. The regulatory structure that may be needed to implement such

a scheme is also presented, drawing heavily on the Chilean experience.[1] Our conclusion, which summarizes the major findings, suggests that privately managed mandatory saving schemes deserve careful consideration as an important part of the old age security system in countries with the human capital, financial markets, and regulatory capacity to run them effectively or the potential to develop these institutions and capacities quickly.

Brief History

The first nationally mandated provident fund was established in Malaysia in 1951; the largest such fund is Singapore's Central Provident Fund (CPF), created in 1955. India and Indonesia established provident funds in the early 1950s, but with limited coverage. Several African countries set up national provident funds in the 1960s, and several Caribbean and Pacific island countries in the 1970s and 1980s. Currently some twenty countries, mostly former British colonies in Africa, Asia, and the Pacific and Caribbean islands, have such schemes. These countries, and others that adopted this model later, had no public pay-as-you-go pillar at the time they established their national provident funds.

Chile is the only country that has fully replaced an existing public pay-as-you-go pension scheme with a government-mandated retirement saving scheme. Chile is also the only country whose mandatory saving program is privately managed, initiated in 1981. It is known as the AFP system, named after the private companies called Administradoras de Fondos de Pensiones that are authorized to run it. The public pension system was replaced because of widespread evasion, unsustainably high contribution rates, and an inequitable benefit structure. One of the main arguments used by the Chilean authorities to promote the AFP system was the failure of the public system to maintain the real value of pensions in inflationary periods. For similar reasons other Latin American countries, including Peru, Mexico, and Argentina, are now in the process of partially replacing their financially strained public pension schemes with a system of the Chilean type. It is curious—although not surprising in view of their age structures and historical experiences—that this transition to a mandatory saving scheme is occurring in older Latin American countries at the same time that several younger African countries are contemplating a transition in the opposite direction.

How Do Mandatory Retirement Saving Schemes Work?

Designing a mandatory saving scheme requires that policy makers answer many crucial questions:

- What should its coverage, wage replacement, and contribution rates be, and should they be uniform for all workers?
- At what age should workers be allowed to withdraw funds and should payouts take the form of annuities or lump sum withdrawals?
- Should management be centralized or decentralized, and if it is decentralized, how much choice should workers have?
- What regulations are needed to ensure that funds are prudently managed, and what guarantees should the state provide?
- What is the best way to minimize costs and maximize returns?
- How can a mandatory retirement saving scheme be integrated with the redistributive objectives of the old age system as a whole?

This section explores these issues briefly. The following sections examine the management and regulatory issues in greater detail.

The Contribution and Target Replacement Rates

In a mandatory saving scheme, the worker's pension is financed by the saving account that accumulates before retirement and its size depends on the contribution rate, the growth rate of earnings, the interest rate, and the number of working and retirement years. If a higher wage replacement rate is desired, a higher contribution rate is required. The required contribution rate rises the longer the retirement period is relative to the working period (the passivity ratio) and the smaller the rate of return is relative to the growth rate of real earnings (Table 1).

The required contribution rate is higher in plans that make poor investments, incur high administrative costs, index pensions to prices or wages, or permit accumulated balances to be used for other purposes such as housing, education, or health care—as is common in national provident funds. Traditionally, pension specialists have assumed that real rates of return are about two percentage points higher than the growth rate of real earnings. But data in World Bank (1994) show that in many countries over long periods the differential has been greater, giving an advantage to mandatory saving plans.

A well-run mandatory saving scheme—with a real rate of return two to three percentage points higher than the growth rate of real earnings, a passivity ratio of about one-half, and price or wage indexation—requires a contribution rate of 10 to 15 percent to cover a replacement rate of 40 percent of gross final year salary, survivors' and disability benefits, and moderate plan expenses (Table 1). A contribution rate much lower than 10 percent will, to a large extent, replace voluntary saving and be used up in transaction costs, rather than increase retirement income. If people retire early or withdraw from the labor force for part of their adult years,

TABLE 1 Contribution Rate Needed to Pay Pension = 40% of Final Salary under Mandatory Saving Scheme[1]

	Non-Indexed Pension				*Pension Indexed to Prices*			
Passivity Rate	*1/2*		*1/3*		*1/2*		*1/3*	
Real Wage Growth	*0*	*2*	*0*	*3*	*0*	*2*	*0*	*3*
Real Interest Rate								
0%	13	18	9	14	20	29	13	20
2%	7	11	5	8	11	16	7	11
5%	3	5	2	3	5	7	3	5
Real Pension Rate at Death[2]	15	15	19	19	40	40	40	40
Relative Pension Rate at Death[3]	15	10	19	14	40	27	40	30

Source: Schwarz (1992); Vittas (1992a).

Notes: [1]Plan expenses and disability and survivors' benefits are not included. These would raise the required contribution rate three to five percentage points in a well run plan. A 5 percent inflation rate is assumed. The one half passivity rate stems from an assumption of forty working years and twenty years of retirement. The one third passivity rate implies 45 working years and 15 years of retirement.

[2]Real pension in year of death as proportion of final year's salary.

[3]Pension relative to average wage at the economy in year of death.

or if the real rate of return is lower than the growth rate of earnings, or if objectives are pursued besides saving for retirement, a contribution rate higher than 15 percent will be required. Differences in the basic parameters of the plan, especially the use of funds for purposes other than retirement, may explain why the contribution rate is as high as 22 percent in Malaysia and Sri Lanka and 35 percent in Singapore, but only 13 percent in Chile (Table 2).

Should young workers be exempted or permitted to pay lower contribution rates, to offset their lower productivity? What about for older workers who have passed normal retirement age and peak productivity? If these workers receive special treatment, higher contribution would then be required in the middle years, which are generally the high point of life cycle earnings. Singapore requires a lower contribution rate for low income workers and recently introduced a lower rate for workers over the age of 55. This schedule helps smooth consumption over the worker's lifetime, a major purpose of the scheme.

Investment and Inflation Risk

In mandatory saving schemes workers assume the investment and inflation risks for their own retirement funds. Investment risk arises from variations in investment performance and is closely related to pension fund solvency risk. Investment risk is particularly high at the time of

TABLE 2 Payroll Tax Rates for Mandatory Saving Schemes, 1991 (percentage of wages)[1]

Country	Percentage of Wages			Combined as a Percentage of Wage Plus Employer Tax
	Employee	Employer	Combined	
Africa				
The Gambia	5.0	10.0	15.0	13.6
Ghana[2]	5.0	12.5	17.5	15.6
Kenya	5.0	5.0	10.0	9.5
Nigeria	6.0	6.0	12.0	11.3
Swaziland	5.0	5.0	10.0	9.5
Tanzania	10.0	10.0	20.0	18.2
Uganda	5.0	10.0	15.0	13.6
Zambia	5.0	5.0	10.0	9.5
Asia				
Fiji	7.0	7.0	14.0	13.1
India	10.0	10.0	20.0	18.2
Indonesia	1.0	2.0	3.0	2.9
Kiribati	5.0	5.0	10.0	9.5
Malaysia	9.0	11.0	20.0[3]	18.0
Nepal	10.0	10.0	20.0	18.2
Singapore	25.0[4]	10.0	35.0	32.0
Solomon Islands	5.0	7.5	12.5	11.6
Sri Lanka	8.0	12.0	20.0	17.9
Western Samoa	5.0	5.0	10.0	9.5
Latin America (1994)[5]				
Argentina	11.0	0.0	11.0	11.0
Chile	13.0	0.0	13.0	13.0
Colombia	2.9	8.6	11.5[6]	10.6
Peru	13.3	0.0	13.3	13.3

Source: Social Security Administration (1993); Columbia (1993); World Bank (1994).

Notes: [1]African and Asian schemes are publicly managed provident funds; Latin American schemes are privately managed.

[2]The provident fund is being converted to a social insurance scheme.

[3]This was raised to 22 percent in 1993.

[4]The contribution varies from seven to 30 percent of gross wages for workers.

[5]For Argentina and Colombia a new plan started in 1994, for Peru in 1993.

[6]This will rise gradually to 14.5 percent in 1996.

retirement, when many workers use their accumulated assets to purchase a lifetime annuity; the level of interest rates and the state of the financial market on the date the annuity is purchased are critical. As we will see below, it is important that schemes include some method of spreading this risk across time.

As for inflation risk, an important question is whether pensioners

should be required to purchase indexed annuities and, if so, whether they should be indexed to wages or prices. Indexed annuities cost more than non-indexed annuities, whether in higher contribution rates or in lower initial benefit payments (Table 1), but they maintain the pension's real value. In a mandatory saving scheme individual workers pay the cost of their own indexation, whereas in a pay-as-you-go scheme, current workers bear this risk to protect current retirees. Whether private companies will be willing or able to guarantee indexed pensions is another matter.

Publicly managed pay-as-you-go defined benefit plans are supposed to protect retirees by transferring these risks to the more adaptable younger generation. In reality, however, retirees are never entirely protected. "Defined" benefits are never completely defined over the long run. They are rarely fully indexed against inflation in developing countries; even OECD countries have skipped cost of living increases in recent years. Thus participants in both types of plans face variants of these risks, and the variants are only partially correlated. For example, mandatory saving plans can invest in equities and real property (whose nominal values generally rise with inflation), in foreign assets (thereby avoiding country-specific shocks), and in indexed instruments (thereby passing inflation risk on those who are willing to bear it). Pay-as-you-go plans do not have these options. Consequently, it is not clear which type of the plan will provide the best inflation insurance and a mixture of the two may reduce risk through diversification.

Centralized or Decentralized Management

In capital-scarce middle income countries, an efficient system of forced long-term saving can lead to high rates of return and economic growth — if the savings are channeled to productive uses and away from precautionary or speculative investments in real estate, precious metals, and land. Risks, costs, and rate of return are strongly influenced by whether the fund is centralized or decentralized. In their ideal state, centralized provident funds that are run by the national government invest productively and benefit from economies of scale that minimize operating costs. Singapore and Malaysia are examples of national provident funds that have low costs and earn stable, though modest, returns. However, more typically, managers of centralized provident funds, which are compulsory monopolies, may have little incentive to operate efficiently or to earn reasonable returns — and may be subject to political pressures to invest unproductively (see Table 3 and Figure 1).

Decentralized competitive plans, by contrast, face market pressures to operate efficiently and maximize returns and are at least partially insu-

TABLE 3 Operating Costs and Investment Returns

Cost or Returns	*Chile 1990*	*Malaysia 1989*	*Singapore 1990*	*Zambia 1988–89*
Operating Costs as Percentage of:				
Annual Contributions	15.40	1.99	0.53	51.73
Average Total Assets	2.30	0.18	0.10	6.80
Covered Annual Wages	1.54	0.40	0.21	5.17
Affiliates Times Per Capita Income	2.31	0.54	0.16	4.48
Real Investment Returns on Individual Accounts Net of Fees	9.2	4.6	3.0	−23.4
Period for Investment Returns	1981 to 90	1980 to 90	1980 to 90	1980 to 88

Source: World Bank (1994); Asher (1992a and b); Vittas (1992b). Calculations of investment returns by World Bank staff.

lated from political pressures to misallocate capital. Workers choose the fund in which they want to place their savings, presumably based on its record of returns and risk. But these plans require a complex regulatory structure to ensure the financial soundness and integrity of funds managers and to prevent workers from making big mistakes. Regulating decentralized mandatory saving schemes requires considerable human capital and institutional capacity, including the ability to enact clear rules and penalize malfeasance in predictable ways. Some elements of modern financial markets are also needed, though these are likely to develop in response to the scheme. For countries that satisfy these criteria, privately managed mandatory saving plans deserve careful consideration.

Impact on the Broader Economy

Proponents of the mandatory saving pillar argue that these plans have beneficial effects on the broader economy, while critics argue that the effects are minimal or even negative. Among the important effects to consider are the impacts on long-term saving, capital allocation, labor markets, income distribution, poverty reduction, and the government's fiscal position.

Implications for Capital Markets

The mandatory saving pillar can be an important instrument for accelerating capital market development, increasing long-term saving, boosting investment in productive capital formation, and monitoring corporate performance. If the current rates of long-term saving and capital accumulation are below optimal levels—as many analysts believe—such changes have the potential to enhance economic growth.

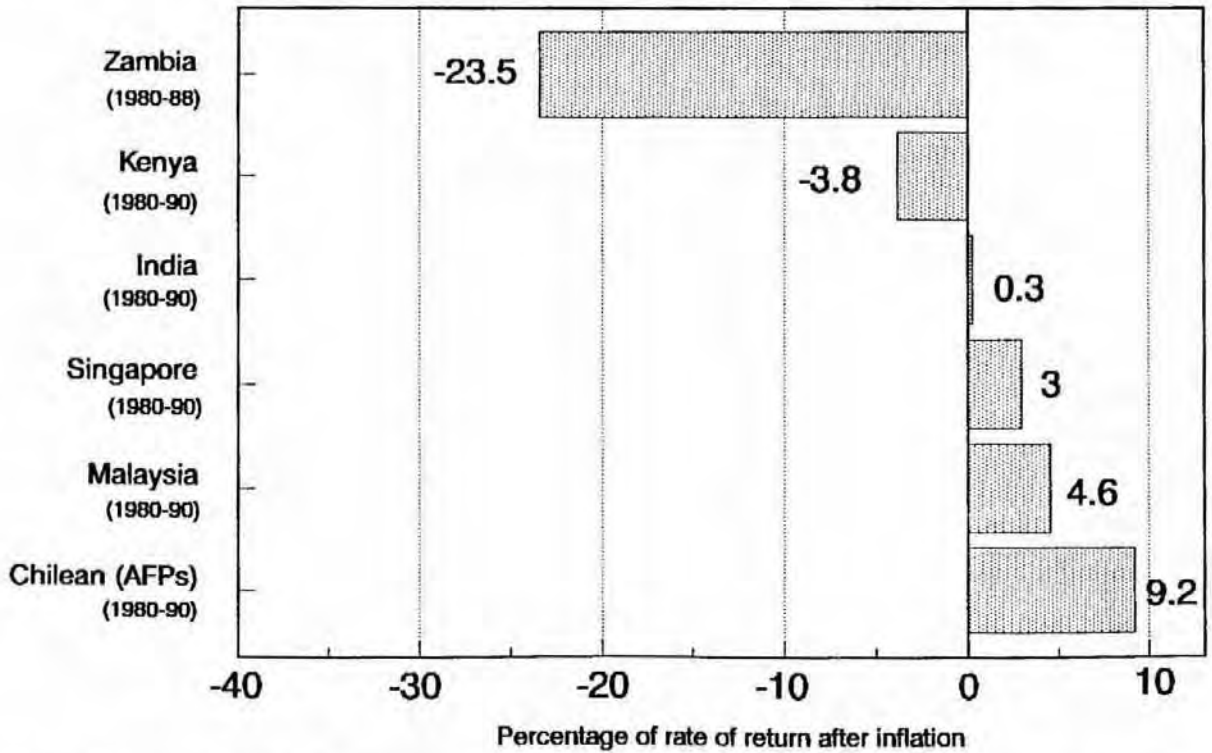

Figure 1. Average annual real investment returns for selected mandatory savings schemes (simple averages). All funds publicly managed except Chilean AFPs. For provident funds, rates are credited to members. Source: World Bank (1994).

Impact on National Saving

One of the most hotly debated issues in pension economics is the effect of pay-as-you-go versus funded schemes on household and national saving. Some analysts argue that pension schemes have no effect on total national saving, that consumers substitute taxes or saving under the scheme for other forms of saving. Other analysts maintain that pay-as-you-go schemes reduce national saving while funded pension schemes displace some personal saving but not on a one for one basis, so total national saving increases.[2]

The crowding out of voluntary saving may be only partial because people are shortsighted and will not save as much on their own for old age. Some of their voluntary saving may be for bequests or for precautionary motives, which are not easily satisfied by mandatory retirement saving schemes. Limits on consumer borrowing may prevent people from dissaving against future pension benefits. Workers may opt for earlier retirement than the system allows; so they may have to continue saving outside the mandatory system. And people may have little faith in the new system, and hence treat their contributions as a tax and continue to save privately for their old age.

The influence of each of these factors is likely to vary by country. Crowding out would be expected to be more substantial in countries where the voluntary saving rate is high, as in most East Asian countries, and smaller in countries where it is low, as in eastern Europe, where private saving was unknown under socialism, or in Latin America, where saving has been discouraged by inflation. Crowding out would be less for poor and young workers, who save little on their own. Also, as the system matures, covered workers begin to retire and dissave their accumulated assets; so the increase in natural saving comes to a halt, albeit at a higher level of capital stock than before.

Overall, then, it seems likely that a mandatory saving scheme will increase saving relative to the situation with no mandatory scheme, but the effect may not be large. However, the positive effect on saving is likely to be much greater relative to a mandatory pay-as-you-go scheme. A pay-as-you-go scheme gives a windfall consumption gain to the first few cohorts of covered workers, and may thereby reduce national saving (other factors remaining unchanged), while a funded scheme does not. The very factors that offset this negative effect of pay-as-you-go plans—myopia, capital market imperfections, increased saving for early retirement, precautionary motives for saving, and lack of faith in the pension system—tend to increase the positive effect of mandatory saving on saving. In Chile private saving went up sharply in the decade after the mandatory

saving scheme was introduced, but because many other factors were changing at the same time it is difficult to pin down how much of the higher saving, if any, was due to the mandatory saving scheme.

In sum, the arguments seem strong for expecting a mandatory retirement saving scheme to have a more positive effect on capital growth than a pay-as-you-go scheme—but the size of the effect is difficult to predict.

Impact on Long-Term Savings

Perhaps more important is the shift in the composition of savings in favor of long-term financial assets controlled by large financial institutions. How quickly long-term resources are accumulated depends on the age of the system, its coverage, and the levels of contributions. In Singapore the resources of the Central Provident Fund rose from 28 percent of GDP in 1976 to 76 percent (despite large withdrawals for housing). In Malaysia the balances of the Employees Provident Fund increased from 18 percent of GDP in 1980 to 41 percent in 1987. In Chile resources in the AFP systems totaled 35 percent of GDP by 1991, often ten years of operation (Table 4).

Thus the mandatory saving pillar can generate substantial long-term financial savings in a relatively short time. Consider the case in which labor income represents 50 percent of national income. A compulsory scheme covering 50 percent of the labor force and imposing a 10 percent contribution rate would annually accumulate funds equal to 2.5 percent of national income. If the rate of return on fund balances equals the rate of growth of GNP (and because pension payouts would be minimal in the early years of operation), such a scheme would accumulate resources equal to 12.5 percent of GNP over five years and 25 percent over ten years. After the first ten years the growing volume of benefits payments would slow the pace of accumulation, although expanded coverage and a rising share of labor income would accelerate the rate of accumulation.

In the very long run—in a closed economy, and even in an open economy if funded plans become commonplace—the marginal productivity of capital and the real rate of return may tumble as long-term savings accumulate. At some point the productivity of capital may fall so far that further high saving is no longer efficient. Since the problem in many countries and from a worldwide point of view now appears to be a scarcity rather than an overabundance of capital, this effect is far off in the future. It can be further forestalled by international diversification, investment in human capital that is complementary to physical capital shifts of labor from the informal to the formal sector, and capital-intensive technological change.

TABLE 4 Assets of Selected National Provident Funds (percentage of GDP)[1]

Country	*1983*	*Most Recent*	*Year Available*
Singapore	53.8	75.6	1991
Malaysia	24.4	40.8	1991
Solomon Island	15.4	—	—
Zambia	9.1	5.8	1989
Sri Lanka	8.1	15.2	1990
Swaziland	6.0	5.4	1987
Nepal	3.8	—	—
India	1.9	4.5	1990
Indonesia[1]	1.0	1.4	1990
Ghana[2]	—	0.6	1986
Fiji	—	43.9	1987
Nigeria	—	0.7	1988
Barbados	—	16.0	1986
Kenya	—	11.5	1989

Source: World Bank (1994).
Notes: [1]Refers to main provident fund in each country.
[2]Refers to both public employees' and national provident funds.
[3]Provident funds are being replaced by social insurance systems.

Impact on Capital Allocation

Establishing a mandatory savings scheme presents an opportunity to stimulate capital markets and expand the supply of productive capital. Nevertheless, the allocation and productivity of this capital depends on whether the funds are publicly or privately managed. Most centrally managed provident funds have been invested in government bonds or in failing public enterprises at low nominal interest rates that become negative during inflationary periods. This is also true of centrally managed reserves of defined benefit plans (World Bank 1994). If government has exclusive access to the funds, spends them wastefully, and pays workers an arbitrary interest rate, the potential advantages of mandatory saving schemes are lost. In fact, such schemes become very much like pay-as-you-go schemes in their capital and labor market effects.

Because of the fungibility of money once it becomes part of the government budget, the real productivity of these provident funds is not known. The funds may increase government consumption or investment beyond what they would have been otherwise — or they may substitute for explicit taxes while holding government spending unchanged. Each has a different impact on national output and its composition and distribution. It is known, however, that the real returns credited to worker accounts was around zero in India and highly negative in Zambia and other African countries (Figure 1). So, for the worker, these systems have failed. And

for the broader economy, their allocations have not been subject to any competitive market test or even public scrutiny.

Even in Singapore, more than 90 percent of fund assets have been invested in non-tradable government securities with an average rate of return of 3 percent in the 1980s (Asher 1992b), similar to that on 12-month time deposits and less than what long-term contractual savings could have earned in the market. The Singapore government claims that it has used these funds productively, both domestically and for investments in foreign assets, but these returns have not gone to the provident fund. The relatively low interest rate paid to the fund could thus be viewed as a hidden tax on workers to finance general government expenditures and reserves.

Most countries with national provident funds allow employees to use part of their balances for housing and other specified purposes, and Singapore now allows limited investments in approved private sector securities. Members are obliged to redeposit the funds with the provident fund if they sell the houses or other investments (Asher 1992a). This use of funds has a positive effect on home ownership and the housing market but reduces the impact of national provident funds as a source of productive capital investment and retirement income. It is not clear that mandatory saving for housing is justified on efficiency grounds.

By contrast, in a decentrally managed competitive system such as that in Chile, workers pick their management company from a small number of authorized AFPs and can transfer their accounts from one company to another. This gives decision-making authority to workers, who are clearly interested in maximizing returns and minimizing risk, and avoids the problem of earning below market returns and encouraging excess government spending. But workers may not have the information needed to make wise choices. Their investments may be too risky in some cases and too conservative in others; so they may eventually become charges on the rest of the society. To counter this problem, the Chilean government has imposed strict regulations to protect the safety and profitability of investments (see below).

Given the decentralized management and the block on personal withdrawals, the Chilean pension system has become a dominant player in the capital market—a force facilitating privatization and growth. Initially the AFPs invested predominantly in government bonds, but gradually they shifted to corporate securities—especially equities, as the Chilean stock market boomed and investment rules were liberalized (Vittas and Iglesias 1992). Now the government must compete for access to funds and pay the competitive market price. The AFP system also invested heavily in the privatization of public utilities in the mid-1980s, accounting for 10 to 35 percent of the equity capital of the privatized utilities—and

even more of the domestically held equity capital. By 1991, 38 percent of AFP funds were in state securities, 24 percent in corporate equities, and about 13 percent each in corporate bonds and bank deposits. AFPs hold more than one-third of all public bonds, two-thirds of all private sector bonds, and 10 percent of all corporate equities in the country (Superintendencia de AFPs, Banco Central Chile).

Perhaps more important, the pension system has stimulated the development of other institutions and practices that have deepened Chilean financial markets over the past decade. These include modern bank supervision, new securities and corporation laws, increased disclosure requirements for public companies, risk classification agencies for bonds, a long-term corporate bond market and a second stock market, new types of mortgage bonds, and improved regulation of insurance companies.

The rate of return to workers in the Chilean system has been much higher than in countries with centrally managed mandatory saving pillars. During the first ten years, the gross annual real return averaged 13 percent, and the average net yield to workers, after fees, was about 9.2 percent, albeit with large variations among different funds and individuals (Acuna and Iglesias 1992). Such high gross returns cannot be expected in the long run, but the high start-up costs of the first two years also will not continue; they have already been reduced from 14.7 percent of assets in 1982 to 1.6 percent in 1992. Overall, this experience is consistent with the observation that decentralized funded plans have earned far higher returns than centralized plans—perhaps reflecting their competitive nature and the market tests for their allocations.

Pension Fund Concentration and Corporate Governance

Mandatory pension funds, if invested in the private sector, could eventually come to dominate the ownership of financial assets that represent claims on the economy's real assets—land, housing, stock, commercial property, and industrial equipment. This ownership structure has implications for corporate governance, since pension funds would become major stockholders and could exercise voting rights and power over corporate management.

The concentration of ownership means that mandatory pension funds could not simply buy and sell shares without disrupting the market, as smaller investors can do. It also makes it worthwhile for them to incur the costs of gathering and processing information, which they can use to monitor the management performance of corporations, thereby estimating corporate efficiency. On the other side of the coin, that may give a small number of pension funds an influential voice in interlocking direc-

torates, an anti-competitive force in strategic corporate decisions. Centralized provident funds are even more concentrated. If these funds were to invest in corporate equities, public officials could gain control of corporate affairs, a back door to nationalization.

In Chile, the three largest companies account for more than 60 percent of total funds and a big chunk of total corporate equity. So far, the AFPs have not attempted to monitor or control corporations, and publicly managed provident funds have not invested in private corporations. But funded plans in other countries are doing so. In the United States, funded occupational plans have begun to monitor the governance of the corporations in which they have an ownership stake. Because this channel allows pension funds to have a far-reaching influence on the economy, it becomes particularly important for them to be concentrated—but not too concentrated—and to have incentives that encourage the right performance from corporations.

Implications for Labor Markets

Mandatory saving plans, unlike public or occupational plans (particularly defined benefit plans), have relatively little impact on the labor market. Since workers eventually recoup their contributions, with interest, they are less likely to see savings as taxes, to be evaded. And since they "own" their accounts, they can carry them along from one job to another with no penalty for mobility. In this sense, the important story is that there is relatively little labor market story, compared with the other types of plans.

Even so, some distortions remain. First, when contribution rates are much higher than households' desired saving rates (presumably the reason for a mandatory scheme), incentives are created to evade by shifting to the informal market, understating covered wages, and substituting in-kind benefits for wages. When interest rates are below market, as is often the case for provident funds, this effect is exacerbated. If workers cannot evade they may be induced, by their higher accumulated savings and compulsory savings rate, to retire early. Thus, mandatory saving plans may reduce the supply of labor, especially experienced labor, in the formal sector. In addition, wage rigidities may prevent employers from shifting their share of the payroll tax to workers—and may decrease employment instead. Singapore seems to have experienced this effect in 1984, when it raised the contribution rate to 50 percent of wages, shared equally by employers and employees. The employers' rate was cut in half the following year because of the belief that this had affected employment adversely. Both these factors imply a tax element that distorts the labor market and limits the efficient contribution rate.

Fiscal Implications

A mandatory saving plan also has few fiscal implications than a pay-as-you-go public plan since workers receive only the value of their contributions plus investment earnings. Political pressure to increase public spending on pension benefits is absent. In fact, governments have borrowed from provident funds at below market interest rates, cutting future pension benefits and current public borrowing costs. But these low rates could increase public deficits if they induce the government to spend more on other goods and services. The danger is that the spending, financed by a hidden tax on workers, may not be productive. (This is similar to the problem posed by large reserves in a partly funded public plan.) Decentralized schemes that charge market rates avoid this problem. But if the government guarantees their benefits, this constitutes another state obligation that could become surprisingly large if strategic manipulation and moral hazard are not controlled.

Another important fiscal effect stems from the tax treatment of pension savings. Tax incentives are not essential for mandatory schemes, but they improve compliance and are therefore common. The tax loss may force the government to reduce spending or to raise other taxes, which could have a high efficiency cost (Valdés-Prieto and Cifuentes 1993).

Contributions to most mandatory saving schemes are deductible for income tax, as is the current investment income from the funds. Workers in Chile are allowed to contribute additional amounts on a voluntary tax-exempt basis. In most schemes, withdrawals are subject to tax, like any other income. The benefits of tax deferral are greater for higher income workers, because their initial tax savings are higher and they are likely to be in a lower tax bracket after retirement. To avoid this perverse redistribution, limits may be placed on the tax-advantaged benefits or a tax credit may be offered rather than making contributions tax-deductible, as has been proposed for occupational plans.

Malaysia and Singapore exempt the contributions and the withdrawals—as well as the interest earned in between—from taxation. The total tax benefits of Singapore's national provident fund (and the government tax revenue forgone) were estimated at slightly more than one percent of GDP for 1987, roughly the tax expenditures for the United States occupational pension system (Turner and Beller 1989). The Singapore fund thus provides a valuable tax shelter for contributors, especially high income workers who would be subject to higher marginal tax rates on other investment income (Queisser 1991). The higher tax benefits received by upper income groups may be one reason they go along with the high contribution rates and low interest rates.

Redistributive Effects and Poverty

Because of the direct link between contributions and benefits, mandatory saving plans, in principle, do not involve redistribution either across or within generations. Non-transparent and perverse redistributions can still occur, however, particularly in centrally managed pension funds, so the system needs to be designed to avoid this possibility.

If the government borrows from provident funds at below market rates, in lieu of increased taxes to finance general public expenditures, this has a redistributional effect since the incidence of the payroll tax is not the same as that of general revenue taxes and is generally more regressive. Or, if the government uses the funds to finance public expenditures that it would not otherwise have undertaken, income is redistributed from fund contributors to the beneficiaries of the additional government spending. Such transfers are difficult to trace (doing so requires knowing what would have happened had the funds not been available) — which is precisely why the transfers are likely to benefit privileged groups, who are in a position to influence government transactions.

Allowing contributors to withdraw funds before retirement also benefits middle and upper income groups. Singapore's national provident fund permits early withdrawals for education, home ownership, and alternative investments as long as contributors maintain a minimum balance in the plan, a condition few low income workers can meet. In some countries plan members are permitted to borrow against their savings at below market rates for specified purchases — an option that again is used mainly by high income groups. A more competitive system for investing pension funds, yielding a higher rate of return, would reduce this problem of perverse redistribution.

Perverse redistribution may also result if retiring workers are compelled to purchase annuities that pool people with long and short life expectancies. Public policies that prohibit distinctions among different demographic and socioeconomic groups in setting the terms of annuities and life insurance contracts have this effect. For example, if regulations require that retiring mine workers and white collar employees pay the same price for annuities, the result would be regressive. This effect could be offset by reducing annuity prices for lower socioeconomic groups, by topping up their accounts directly, or by paying large benefits to their survivors. Similarly, regulations that pool men and women redistribute expected lifetime income from the former to the latter, who live longer.

Most mandatory saving schemes avoid this problem by paying lump sums instead of annuities on retirement. But this means they do not provide longevity insurance and do not protect the very old against pov-

erty. Chile gives workers a choice between purchasing an annuity or taking phased withdrawals that are scheduled to last an expected lifetime and that avoid the redistribution problem. Chile also requires all employees to purchase term life and disability insurance, in which mine workers get a net benefit if they are in the same pool with white collar workers.

Another problem with mandatory retirement saving schemes is their failure to protect low wage workers with interrupted careers, such as women, who may never accumulate enough in their pension accounts to support themselves in old age. Along similar lines, the pensions may fall below subsistence standards because of inflation or low investment returns. For that reason, mandatory saving can leave considerable old age poverty.

Some of these possible sources of poverty can be handled without public transfers. In Chile, the purchase of private disability insurance and term life insurance is compulsory. Most provident funds do not provide or require such insurance, leaving survivors and disabled workers largely unprotected and poor. Regulations could require joint contributions and joint ownership of retirement savings accounts between spouses, protecting women whose labor force participation has been interrupted. Beyond that, governments can deal with the problems of long-term poverty alleviation and extreme investment risk by guaranteeing a minimum pension based on years of employment—or by redistributive social assistance programs; this might be considered an accompanying role of the public plan. Chile provides such assistance and guarantees, financing them from general tax revenues.

Regulatory Issues in Decentralized Schemes

Decentralized competitive systems are more likely than centralized provident funds to maximize investment returns and contribute to capital market development. But decentralized plans raise a host of public policy issues related to the fiduciary standards of pension companies, the safety of their investments, the range of products offered and of information disclosed, the size of fees and commissions, the kind of advertising and other marketing expenses incurred, the guarantees provided by government, and the regulatory apparatus needed to monitor all these elements. Extensive regulation is needed because workers often lack the expertise needed to invest wisely. Private pension companies, if left unchecked, might mislead their members or might take too many risks in order to maximize yield and attract new accounts, or might be too conservative to keep up with inflation. Given the long-term nature of pension investments, once the damage becomes evident it may be too late for the

worker to recover financially through new saving. Trying to remedy this flaw through government guarantees may create moral hazard problems, if the guarantees exacerbate a tendency toward risky investments. Regulations are designed to protect both individual workers and society from perverse competition in the face of information deficiencies. This protection is particularly important in a mandatory program.

Can governments be counted on to regulate decentralized systems well, having already shown that they cannot control centralized pension funds very well? And, at what point does a strict regulatory structure wipe out competition and become government control? The experience of Chile is used to explore what kinds of regulations are workable and may—or may not—be advisable.

Ensuring the Solvency of Funds and the Integrity of Managers

Which funds qualify as custodians of mandatory saving accounts? To ensure competent and responsible administration of pension funds and to protect their solvency, criteria must be established on entry and minimum capital margin and fund managers must be vetted by the supervisory authorities. The shortage of local expertise in many developing countries can be overcome by using foreign fund management companies in joint ventures with local firms. Developing countries that are reluctant to use joint ventures may have a hard time assembling the expertise needed to run pension funds well, especially in the early years.

Chile limits participation in the mandatory scheme to the Administradoras de Fondos de Pensiones, or AFPs, specialized pension fund management companies. The AFPs are regulated and supervised by the Superintendency of AFPs, which has authority over charter approval. The AFPs are set up as joint-stock companies. Any group of shareholders, including large corporations, trade associations, labor unions, and other financial institutions (but not banks), can establish an AFP. Until recently, the three largest AFPs, serving about two-thirds of the market, were joint ventures.

The pension fund is an independent entity, segregated both legally and financially from the AFP and its other activities. The assets of the pension fund belong exclusively to individual members, are not attachable, and are not affected by any financial losses suffered by the AFP. AFPs are required to maintain investment reserves equal to one percent of the total assets of the pension fund they manage. Reserves must be invested in the same assets as the pension fund under AFP management to ensure that AFPs apply the same professionalism in investing the resources of the pension fund as they do for the AFP's own resources. Pension funds are valued daily at market prices (much like mutual funds) or, for assets for

which there are no daily market values, according to a valuation model developed by the Superintendency of AFPs.

In Chile, workers choose their own AFP and are permitted to switch their accumulated balances to another AFP if they are dissatisfied, creating competition among AFPs. To simplify matters, regulations impose a strict limit of one account per worker and one fund per management company. These regulations are very restrictive—and controversial. Allowing workers to have accounts with more than one company would let them hedge their bets and reduce their dependence on the performance of a single company. Similarly, allowing management companies to operate a wider range of funds would allow them to tailor products to different tastes and age groups. For instance, equity funds might appeal to younger workers, mixed stock/bond funds to middle-aged workers, and money market funds to older workers. The unit account-unit fund rule reduces variety and choice, two of the potential advantages of competition.

These two restrictions are aimed at preserving the simplicity and transparency of the system, characteristics that are considered important for a compulsory scheme involving large numbers of financially unsophisticated people. Allowing companies to manage a wider range of investment funds would complicate compliance monitoring. For example, it would become more difficult to prevent withdrawals or a concentration of workers' portfolios in risky assets. As the system matures, and workers gain financial experience, regulations may become less restrictive. But in the meantime, the cost of simplified regulations is the loss of choice and risk diversification.

Keeping Investment Risk Within Reasonable Bounds

Financial regulation aims to ensure fairness for all participants, including protection from fraudulent or imprudent behavior by the managers of financial institutions—a task that assumes particular importance in mandatory retirement saving schemes because of their compulsory nature and long-term contracts. One way to provide such protection is through regular disclosure of information. AFPs in Chile are required to provide statements to contributors three times a year, disclosing the last four monthly contributions paid by employers, the financial performance of the pension fund, and the accumulated balance and rate of return on individual accounts.

Participants are further protected through investment rules. Chile started out with rigid investment regulations, and gradually eased them as funds and experience increased. The limits on equity investments, for

example, have been steadily increased, and investments in overseas securities, which were not allowed initially, have been authorized.

Investment rules are guided by two operating principles: safety and profitability. Safety implies that pension funds are invested in approved assets and properly diversified, while profitability implies that fund management companies are free to seek the highest returns subject to these rules. Thus only upper limits are imposed on investments, to control the exposure of pension funds to particular risks. There are no floors requiring purchase of government bonds or other "socially useful investments." Currently, the upper limits are 50 percent on government bonds, 30 percent on corporate equities, 10 percent on foreign securities, and similar limits on bank deposits, mortgage loans, and other assets (Vittas and Iglesias 1992). Ceilings also apply to permissible investments in the securities of individual companies. Ceilings are higher for "Chapter 12" companies, which accept severe restrictions on their management independence. So far only recently privatized utilities have opted to qualify for Chapter 12, which has allowed pension funds to play an important role in their privatization.

The dispersion in returns across AFPs is reduced through the regulation of maximum and minimum returns. If a fund's real investment return over a rolling 12-month period is 50 percent or two percentage points higher (whichever yields the higher rate of return) than the average for all pension funds, the AFP has to place the difference in a profitability reserve, which becomes an asset of the pension fund, not the AFP. Similarly, if the real investment return for a pension fund is less than half the average of all pension funds or two percentage points lower (whichever yields the lower rate of return), the AFP is required to make up the difference by transferring funds from the profitability reserve and, if this is inadequate, from its own investment reserves. If an AFP is unable to make up the shortfall, it is declared bankrupt, its pension fund assets are transferred to other AFPs, and the government makes up any remaining difference. So far, the dispersion in returns among AFPs has been so low that no profitability reserves have been established; three AFPs have been dissolved or merged because of failure to maintain the one percent investment reserve.

Maximum and minimum limits on pension fund returns are designed to protect workers against excessive fluctuations in returns and to avoid wide dispersion across AFPs. But they may also induce herd behavior, since firms are penalized for being different, not for being wrong. In addition, using a 12-month average in calculating returns unduly emphasizes short-term performance, an undesirable attribute for long-term contracts that may span 60 years or more. An AFP that persistently per-

forms at the lower end of the permitted range would produce substantially lower than average returns over a period of many years. An alternative approach would apply narrower limits (say 25 percent rather than 50 percent) on performance over longer periods of time, say three to five years. Another alternative would specify the maximum and minimum returns in terms of the top and bottom 10 percent of funds, or those that are more than two standard deviations away from the average. The better informed workers are, the less need there will be for such regulations, as workers shift savings away from consistently poor performers.

To protect against inflation, pension fund managers could be required to invest a portion of their portfolios in assets that provide an effective hedge against inflation, such as equities, real estate, foreign assets, or indexed bonds. Though Chile does not require indexation by AFPs, this position is widespread in Chilean financial markets—a response to demand in an environment in which inflation has historically been a problem. More than 95 percent of AFP assets are invested in equities, indexed bonds, or real assets, including indexed bonds issued by banks or private firm. This counters the common assertion that the private sector cannot offer indexed securities or insure against inflation. Hedging against inflation would be much more difficult, however, in countries with less developed financial markets, poorly indexed financial instruments, and a high and volatile inflation rate.

Allowing Investments in Overseas Assets

There are strong advantages to international diversification of pension funds, particularly for countries with small or concentrated domestic economies. Lower risk and sometimes higher returns are possible over the long term through international investment, which reduces the exposure of investors to country-specific risks such as inflation and gives them an opportunity to move their capital to countries that offer the highest return. Open capital markets may also impose fiscal discipline which is badly needed in some countries. But they also raise fears of institutionalized capital flight, loss of control by mandatory authorities, and depriving local markets of the benefits of the increased availability of long-term funds.

Perhaps because of these fears, few countries with national provident funds invest abroad, a major reason for negative returns in countries with high inflation. Singapore is an exception. Using assets borrowed from the provident fund, among others, two public agencies have invested abroad, the Monetary Authority of Singapore in short- and medium-term securities, and the Government of Singapore Investment Corporation in longer-term foreign equities and other assets. The authorities claim the

returns on these foreign investments have been high, but the claims cannot be corroborated since no published data are available and the accounts of the two agencies are not audited. At any rate the returns go to the government, not to the provident funds, which receive low interest rates from the government. Pressures are mounting in Fiji and in Malaysia to allow their national provident funds to invest in foreign securities, since the funds are now large and government borrowing needs have subsided.

Chile did not allow the AFPs to invest in foreign securities until 1991, and then only on a gradual schedule, beginning at one percent of funds and rising to 10 percent (perhaps higher) by 1995. Authorizing investment in foreign securities represents a recognition of the maturity of the system, the large size of the pension funds, the saturation of domestic markets, and the growing need for diversification of country risk. It is also a response to the large capital inflow that Chile has been experiencing in recent years. Conversely, liberalization of capital outflows may encourage inflows by convincing foreign investors that they will be able to get their money out.

Chile's approach may be too cautious. In particular, saturation of the domestic market would come sooner in smaller countries, suggesting a need to relax investment rules at a much earlier stage and to a much larger extent. The new scheme in Argentina permits investments of up to 10 percent in foreign securities from the start.

Regulating Fees and Commissions

In principle, competition among plan administrators should make regulation of fees and commissions unnecessary. In practice, agency and information problems often lead to distortions in the structure of fees and commissions, as Chile's experience suggests. Since mandatory saving schemes are, by definition, compulsory, and economies of scale in the pension industry may result in concentration, investment companies may end up charging more than they would in a purely voluntary competitive scheme.

Chile regulates the types of fees that AFPs can levy but not the level of fees or the structure of commissions paid to agents. Authorized fees include a fixed fee per contribution, a prorated fee on wages subject to pension contribution, fees for opening new accounts, fees per pension payment, and fees for voluntary savings accounts. No AFP has imposed the last two fees, and only one has levied a fee on new accounts. Fees may not be assessed for closing an account, to prevent AFPs from discouraging account transfers. AFPs were initially allowed to charge a management fee on the total value of funds under their management, but this

fee has since been disallowed because of its depleting effect on the accounts of those who were out of work and no longer contributing.

The flat fee per contribution is probably the most controversial. This fee would seem to be regressive, but it may simply reflect the real costs of handling an account. This fee was high in the early years of the program, leading to lower net rates of return to lower income workers, but competition combined with negative publicity has led most AFPs to abolish or greatly diminish it. A prorated fee of about 1.5 percent of covered wage is currently the major fee, and net returns have been largely equalized across income groups (Acuna and Iglesias 1992).

Keeping a Lid on Operating Costs

Decentralized systems that allow workers to choose management companies and transfer accounts tend to incur higher operating costs than efficiently run centralized plans. Decentralized systems cannot achieve the same economies of scale, they incur high marketing and transactions (switching) costs, and they perform additional functions, such as investment research and processing (which may, however, result in higher rates of return). At the same time, decentralized plans have more incentive to operate efficiently than centralized plan that have a monopoly in a compulsory system. These factors help explain why, in 1990, operating costs were 1.5 percent of covered wages and 2.3 percent of total assets in Chile's decentralized system, compared with 0.2 percent and 0.1 percent in Singapore's and 0.4 percent and 0.2 percent in Malaysia's centralized systems, while the costs of Zambia's centralized system were 25 times higher than Singapore's and ate up half of all contributions (Table 3).

Competition may be very imperfect in financial markets that are serving a mass, relatively uneducated clientele. Where investors are unable to collect and analyze information about prospective rates of return, they are susceptible to intensive marketing campaigns, which create barriers to entry and increase costs. Promotional expenses are estimated to account for as much as 30 percent of operating costs for Chile's AFPs. Paying salespeople by commission leads to high turnover of accounts and high transaction costs, which are eventually passed on to consumers in the form of high fees. Advertising campaigns also tend to emphasize short-term performance.

Requiring companies to provide data on fees and commissions as well as investment performance over longer periods (three, five, and 10 years) would provide a more accurate picture of relative returns and might also help to keep operating costs down. Marketing costs and account turnover would decline if transfers, which workers might choose during an open enrollment period, were limited to one per year. Market-

ing costs might also fall if AFPs were allowed to pass along the savings to long-term affiliates in the form of a bonus on their rate of return or a reduction in their required fee. The entry of new AFPs in a competitive market may eventually lead to lower costs and fees. Economies of scale and learning by doing as the system grows will undoubtedly enhance efficiency. Indeed, costs fell dramatically through the 1980s, are now about 1.6 percent of total assets, and are lowest for the largest AFPs.[3]

Regulatory Annuities

Under Chile's mandatory retirement saving program, workers must purchase term life and disability insurance. Chile's scheme also provides for the voluntary purchase of annuities at the time of retirement. These insurance-related elements give rise to a host of potential problems in the annuities market.

In Chile, insurance agents receive large commissions up front, giving them an incentive to withhold information or to shade the truth in order to gain a customer. Since the purchase of an annuity is an irreversible act, a wrong decision by an ill-informed retiree may have disastrous consequences that cannot be readily corrected. Chile imposes no restrictions on these commissions or on the sale or range of acceptable annuity products, other than to require price indexation, but it is considering various measures to control commissions and inform workers about their options. One proposal is to limit annuity products to two or three standard options, such as partially indexed life annuities for the retiree combined with survivor benefits for a 10- or 20-year period, or joint annuities that cover the entire lifetime of the retiree plus a designated beneficiary. That would simplify comparison shopping for annuities offered by different companies. Broad disclosure on premiums and commissions would also be required. Other proposals call for independent professional advisers to assist retirees in evaluating annuity choices and for the establishment of an ombudsman to investigate complaints and arbitrate disputes. These proposals, which focus on increased information flows, should help the market work better. Some analysts believe that increased competition will eventually lead insurance companies to move toward direct sales of annuities, which would reduce the price by cutting out the commission.

Another problem concerns the worker's exposure to the risk of a sharp decline in the market at the time of retirement, when the annuity is purchased. This risk could be reduced by requiring workers to purchase small annuity contracts periodically once they reach a predetermined age, such as 50. By reducing the lumpiness of the purchase this method would diversify the interest rate risk, but would, at the same time, increase workers' exposure to the risk of insurance company insolvency, making

regulation of fiduciary standards all the more important. The timing problem could be mitigated more effectively by developing variable annuities, whose value would rise and fall with the market rather than being fixed at the retirement date. This would reduce the worker's to market conditions at retirement time, but would continue the investment risk throughout retirement. Such variable annuities are used in South Africa and the United States. Caps on annual movements in value of variable annuities might make this risk more acceptable to retirees. Similar variable instruments, with caps on annual movements, have been developed in the mortgage markets.

Monitoring Compliance by Investment Companies

Close monitoring of investment company behavior is essential to ensure compliance. Supervision in Chile's AFP system includes daily reports on investment transactions and monthly reports on each company's financial position and performance. Compliance with investment limits is monitored continuously. On-site inspections are undertaken periodically to ensure the accuracy of submitted returns. Though the arrangement works well in Chile, countries with weaker regulatory capacity might have difficult time in effectively monitoring decentralized firms.

Chile's system is supervised and controlled by the Superintendency of AFPs, an autonomous agency linked to the Ministry of Labor and Social Security. The Superintendent is appointed by the President, and the agency enjoys considerable independence and authority. The Superintendency has the right to authorize and revoke the license of AFPs, to issue detailed regulations for the smooth functioning of the system, and to promote changes in the law. The agency, which employs more than 100 lawyers, financial auditors, examiners, and others, supervises the investment of AFPs, the operation of profitability reserves, the crediting of member contributions, and the payment of pensions.

An ever present danger in regulatory systems is that the regulated will "capture" the regulators and prevent them from operating effectively. Although this does not seem to have happened in Chile, countries with a weaker regulatory capacity might have a more difficult time monitoring decentralized firms. Countries should assess their institutional and human capital capacities for regulating effectively before understanding a decentralized mandatory saving plan.

Guaranteeing Pensions and Pension Returns

Various types of government guarantees are designed to ensure at least some pension coverage for everyone. In countries with mandatory saving

plans social assistance is often provided to people who are not covered by the scheme and a minimum return or minimum pension may be guaranteed to those who are covered. These guarantees have a redistributive function and are usually financed out of general revenues.

Singapore provides modest benefits (12 percent of the average wage) to poor old people, widows, and orphans through a social assistance program financed from general revenue. It specifies the rate of return that is paid to the provident fund. But it does not provide a guaranteed minimum pension.

Chile's system includes four types of state guarantees. First, the government pays a low social assistance benefit of about 12 percent of the average wage to old people not covered by the mandatory saving plan. Second, for workers who have contributed to the mandatory saving plan for at least 20 years, the state guarantees a minimum pension of about 22 to 25 percent of the average wage. Third, a minimum profitability rate is guaranteed for each pension fund relative to the average for the country. Any shortfall in rate of return is covered first through the profitability reserve and then through the investment reserves of the AFP. If these are inadequate, the AFP is forced into liquidation, and the state makes up the shortfall. Finally, the government guarantees annuity payments for old age pensions and disability and survivorship benefits in case of insurance company failure. The guarantee covers 100 percent of the minimum pension and 75 percent of the difference between the minimum pension and the value of the benefit involved up to a specified limit. These guarantees are financed out of general revenues.

What are the likely costs of such guarantees? As long as the rate of return remains at least two percentage points above the growth rate of wages, most people who work full-time during their active years (about 40 years) will receive a pension far above the minimum without any public transfers (Table 1). But a problem arises if low income workers contribute just long enough to qualify for the subsidized minimum pension (20 years) and then escape to the informal sector to avoid making further payments. As many as 30 to 40 percent of covered workers in Chile may fall below the minimum if strategic evasion is common or if fund performance falls drastically. But even then the government has to make up only the shortfall between the minimum pension and the benefit payable by the pension fund.

Simulations indicate that these guarantees will cost less than one percent of GDP, easily absorbed in a country such as Chile that has only a small budget deficit (Gillion and Bonilla 1992; Diamond and Valdés-Prieto 1994; Wagner 1991). But the cost of a minimum pension ought to be carefully calculated in advance to ensure that the state is not taking on a large unfunded liability that it will be unable to meet. If the cost is

expected to be high, the minimum guarantee should be lowered or the required contribution rate raised, unless the government wishes to use general revenue finance as a redistributive instrument.

A contrasting problem is that a minimum pension of 22 to 25 percent of the average wage, as in Singapore and Chile, is well below the poverty line in most countries and the social assistance of 12 percent is below subsistence. One way to attack both the evasion and the poverty problems is to guarantee a higher minimum pension to workers who have contributed for more years. For example, the guarantee could be set equal to 12 percent of the average economy-wide wage (the universal floor for everyone over age 65) plus 5 percent for every year of contributing and employment, up to a specified maximum. A worker with 20 years of service would then be guaranteed 22 percent of the average wage and one with 45 years' service would be guaranteed 35 percent, which might be the maximum guarantee. Given the 10 percent contribution rate and the link to years of employment, this scheme would not cost the government much more than the current one in Chile, and might even cost less.

Conclusion

Mandatory personal saving schemes require workers to accumulate a pool of long-term savings for consumption in old age. Since the schemes are not tied to place of employment, they are more portable and diversify risk more than occupational plans. They are also likely to be more concentrated and therefore benefit more from economies of scale than occupational plans. Since they make benefits directly contingent on contributions, they are less likely than public plans to induce evasion and shifts of labor to the informal sector. Political pressures for poor design features—such as early retirement, non-sustainable pension levels, and hidden redistribution to influential groups—are avoided because each person's contribution determines the benefits that person ultimately gets. If evasion or early retirement does take place, the costs are borne by the individual worker, not by others in the plan.

Mandatory saving schemes have the potential to stimulate capital accumulation and the development of modern financial instruments and institutions. But if governments are given exclusive or favored access to the funds, many of these potential advantages are lost. When the pension funds are publicly managed, they are invariably required to be invested in government debt as a source of general revenue in return for low nominal rates of interest that become negative during inflationary periods. Often the government has used the funds for consumption rather than productive investments, canceling out the positive effect of these plans on long-term saving.

In principle, centralized national provident funds could become competitive by turning them over to one or more private managers on the basis of competitive bidding and with the authority to invest in private sector securities. This procedure, which has been considered in Malaysia, would enable the fund to minimize marketing costs, reap economies of scale, and possibly earn a higher rate of return. But the potential for corruption and cronyism in the bidding process would outweigh this advantage in many countries. Another option would retain centralized control but passively index the fund to the domestic and international stock markets, a procedure that is followed in the voluntary occupational plan for federal government employees in the United States. But many developing countries lack the necessary securities market for indexation. In any event, most governments have demonstrated that they do not want to relinquish privileged access to national provident funds.

Empirical experience indicates that decentralized mandatory saving schemes are likely to achieve higher returns and allocate capital more efficiently than centralized schemes. Political interference over investments is always a possibility, but decentralization makes this explicit and sets up a constituency against it—private pension funds and their worker affiliates. The danger is that workers' choice of investment might be ill informed, eventually leaving many people without adequate pensions. Regulation must walk a fine line between adequately protecting workers and giving funds enough latitude that competition and investment choice are not stamped out. To minimize risk:

- Only prudent companies, including joint ventures with experienced foreign firms, should be allowed to manage pension funds.
- Information disclosure should be emphasized.
- Investments should be diversified and subject to ceilings, not floors.
- There should be no requirement to invest funds in public securities.
- The range of funds, marketing expenses, and annuity products could be limited in the early years of the system and then gradually expanded.
- Investment in overseas securities should be encouraged in order to reduce exposure to country-specific risk.

Decentralized mandatory saving schemes will function best in middle or high income countries with a population well enough informed to make intelligent investment decisions, with financial markets that offer (or could be prompted to offer) a variety of debt and equity instruments, and with effective regulatory institutions or the capacity to develop the institutions quickly. Because financial market development and a regulatory apparatus are necessary for continued economic growth of all

countries, funded pension plans are more viable as countries develop and can also speed up the development process.

Mandatory saving plans can provide an adequate pension for middle and high income workers, but they fail to protect workers with low wages as they grow old or to insure against sharp dips in investment performance. To alleviate long-term poverty and to help diversify risks, these plans must be accompanied by a minimum pension guarantee or other publicly financed redistributive benefits, thereby ensuring old age security for all.

This chapter draws on and extends chapter 6 of World Bank (1994). The work is a product of the staff of the World Bank and the judgments made do not necessarily reflect the views of its Board of Directors or the government they represent.

Notes

[1]Major sources on Chile are Acuna and Iglesias (1992); Diamond and Valdés-Prieto (1994); Gillion and Bonilla (1992); Valdés-Prieto (1993); Vittas and Iglesias (1992); Wagner (1991). For a discussion of broader issues concerning defined contribution plans see Bodie and Merton (1988); Valdés-Prieto (1994); Vittas (1992a and b); Vittas and Skully (1991). Additional background is available in World Bank (1994); see especially chapter 6.

[2]Most of this literature focuses on public pay-as-you-go schemes and occupational pension plans. For surveys of this literature see Atkinson (1987) and World Bank (1994).

[3]For a further discussion of pension costs see Valdés-Prieto (1993); Mitchell, Sunden, Hsin, and Reid (1994); and James and Palacios (1994).

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Comments by Alan J. Auerbach

This is a difficult study to discuss because its arguments are both compelling and non-controversial. In large part, this is because the chapter never really confronts the question its title poses, namely, are mandatory saving schemes the answer to the old age security problem? What the chapter does do admirably well is to describe how these forced saving schemes work, in theory and practice, what the economic and political pitfalls are in different approaches, and how these pitfalls can be overcome. Thus, we are given a manual for how to implement a mandatory saving scheme, but remain uncertain whether we should do so, alone or in conjunction with other pension reforms. I do not mean this as a criticism of the study, but rather of the title. It is not clear exactly what the "old age security problem" is. Indeed, it is probably several things, not all of which can be addressed using mandatory saving schemes.

The chapter does answer a number of important questions about mandatory saving schemes. Among these are the following.

How can such schemes be justified?

The primary purpose of such schemes is to give workers a retirement income that is closely tied to the contributions they make while working. Unlike a defined benefit plan, in which the benefits tend to be loosely tied to any implicit or explicit worker contributions, a forced saving scheme is relatively transparent from the worker's perspective. This has the economic advantage of reducing the labor supply distortion that might be associated with systems, like the United States social security system, in which contributions and benefits are only very loosely related. It has the reinforcing political advantage of establishing property rights of workers to the accumulating assets.

How should assets of such schemes be invested?

To preserve the sense of ownership that workers have to their mandatory saving accounts, Estelle James and Dimitri Vittas stress the importance of not allowing the government favorable access to the funds. That is, there should be no forced holdings of government bonds at below market interest rates. This objective will be furthered by having private sector portfolio management.

However, there is a serious question of how much choice individual workers should have over their investment options. Even in a country like the United States, with a very developed financial system, there may be a need to provide such regulation to limit the fleecing of unsophisticated worker-savers. In a developing country, with developing financial markets, the problem is likely to be greater.

To me, though, there is an obvious solution, which James and Vittas view with ambivalence: invest most of the money abroad. In addition to the usual argument in favor of doing so—that this provides optimal portfolio diversification—there is the strong advantage of not having to worry about the shenanigans of local portfolio managers or the stability of the domestic economy. The chapter suggests at one point that such overseas investment should occur only gradually, once domestic investment opportunities have been used up. Otherwise, one of the potential advantages of forced saving, the access to more investment capital, would be lost. But this seems inconsistent with the idea of letting investors earn their best returns. Forcing them to invest domestically is only slightly less invidious than forcing them to invest in government bonds with below market returns.

How should retirement income be structured?

When workers do near retirement, there is a question of how they should receive their accumulated funds. A simple answer is to give them a lump sum and leave the decision up to them. As James and Vittas point out, though, this goes against one of the reasons for having the forced saving in the first place, that workers need protection against their own myopia. The lump sum may be spent quickly, leaving the elderly without the assets needed to finance consumption. The authors favor forcing retirees to buy an annuity with some or all of the funds. To prevent adverse selection, they advocate forcing this to be done upon retirement. But they worry about the fact that this exposes retirees to "investment risk" in the sense that, on the day their assets are converted into an annuity, the market may be "abnormally low." I am not sure what abnormal means in this context, nor do I see the obvious benefit to the "smooth-

ing" of annuity purchases over a period of several years. But I do agree with their alternative solution, which is to allow the use of variable as well as fixed annuities. James and Vittas suggest that one problem of private annuity provision is overall longevity risk, because this cannot be pooled and may cause annuity providers to become insolvent. I do not see why this is a problem, as long as the rate paid on the annuity is allowed to vary with group mortality experience.

Can mandatory saving schemes help the current elderly?

The chapter argues that a mandatory saving scheme is, by its nature, a funded scheme. Thus, it cannot be used to bail out current retirees. Although I agree in substance, there is nothing preventing the government from issuing marketable debt as it establishes the scheme, and giving this debt to the current elderly to mimic the assets they would have accumulated had the system been in force while they were working. (See, e.g., Auerbach, Gokhale, and Kotlikoff, 1992.) Why one would wish to do so is another matter.

Can mandatory saving schemes be used for redistribution within a cohort?

James and Vittas argue that a forced saving scheme "can provide an adequate pension for middle and high income workers, but fails to protect workers with low wages as they grow old." They argue that an old age pension plan needs low income supplements to make it work. This is, of course, the philosophy behind the United States social security system, but it makes no sense to me. If an individual has low wages his or her entire life, and is forced to save the same fraction of these wages as a higher income individual, in what sense is the resulting asset accumulation inadequate? It is inadequate to provide the low wage individual the high wage individual's standard of living, but it may be perfectly adequate to maintain the low wage individual at his or her own lifetime living standard. The issue, in other words, is not old age poverty, but all poverty. Why should there be a separate program for the poor elderly? But, then, why should other countries be more rational about this issue than we have been?

In short, then, forced saving schemes can be used to insure against worker myopia or the equivalent problem of individuals purposely not saving for their old age because they believe that society will take care of them if they do not. The schemes should not be viewed as a source of cheap capital or as a means for redistributing income. However, there is significant benefit to attacking different problems with different programs. This will protect mandatory saving schemes from political pres-

sure. It may also lead policymakers to reevaluate the logic of their different goals.

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Comments by Donald S. Grubbs, Jr.

This stimulating chapter provides information and ideas on mandatory savings schemes in developing countries. I also find it interesting to consider how the concepts might apply to the United States and other industrialized countries, and in turn how the experience of industrialized countries applies to developing countries (see also Watson, Salazar, and Stroinski, 1993).

Mandatory savings schemes serve the dual purposes of providing capital formation and meeting retirement income needs. James and Vittas recognize that the mandatory savings schemes leave gaps in meeting retirement income needs, and accordingly they state that such programs must be supplemented by a public program that ensures a basic income floor. They do not report the extent to which most countries that have established a mandatory savings scheme have such a public basic income floor. In the United States the social security system provides a basic income floor, and public policy encourages voluntary programs established by employers to supplement the basic income floor, but somewhat fewer than 50 percent of all private sector employees are participants in a plan of their current employer. To solve this problem in 1970 I began advocating that a mandatory supplemental program be established in the United States; in 1981 the President's Commission on Pension Policy endorsed a variation of my proposal (PCPP 1981).

Lifetime Inflation-Adjusted Incomes

A primary reason for having a mandatory system is that individuals need the retirement income that it can provide. If such a system is to succeed, it must assure that the income will continue throughout the lifetime of the retiree (and the retiree's spouse where appropriate). The income needs to be one that does not increase in purchasing power during the retirement years. To the extent that retirement benefits do not continue

throughout the retiree's lifetime and keep pace with inflation, a program fails in meeting human needs.

James and Vittas discuss the difficult problem facing defined contribution plans in providing such a flow of income to meet retirement needs. Many of the programs described are clearly failures in this regard. The failure of countries to adopt programs that can meet retirement income needs may be the result of faulty analysis or shortsightedness, but it should not be surprising. Many U.S. employers and individuals are following the same shortsighted approach.

Most employees are not able to convert a lump sum distribution into a lifetime income that keeps pace with inflation. Chile's alternative of providing an income for the number of years in the retiree's life expectancy may leave about half of retirees destitute in their later years.

It was encouraging to read that the marketplace in some countries has responded by making available inflation-adjusted life annuities, financed through inflation-indexed bonds. Mandatory defined contribution systems would better accomplish their objectives if they were required to make all distributions in the form of indexed life annuities, funded either with private insurers or a federal portability system. (For a discussion of how such a system might work see Grubbs 1983.)

The authors describe the "perverse redistribution" that results from pooling people with long and short life expectancies. Of course every issuance of annuities is based upon such pooling. A system may pool males and females, educated and uneducated individuals, smokers and non-smokers, overweight and average weight individuals, people of different races, healthy individuals and those with health problems, and so on. These various groups have differing life expectancies, and an argument can be made that the amount of annuity provided to each category should differ accordingly. While not recognizing all such differences in experience can arguably be termed "redistribution," it is not necessarily perverse. Women, for example, have as much need for monthly income as men. Making determinations of which distinctions in life expectancy to recognize and which not to recognize, and making determinations of who is in which group and how much annuities should vary for each group, can waste dollars in administration that would be better spent providing benefits, and can create as many inequities as it relieves.

Governmental or Private Operation of the Programs

The programs described by the authors are defined contribution plans that fall into two categories: "provident funds" administered by the government and privately managed programs. The privately managed programs are invested primarily in corporate stocks and bonds, while the

provident funds are invested in governmental obligations that have been less effective in contributing to long-term saving and capital market development and that have generally provided lower rates of return. The authors indicate that investment in governmental securities is a disadvantage of provident funds. Apparently none of the developing countries have tried having a governmentally administered program invested in private sector investments and the authors do not discuss this possible alternative. In the United States we have two examples of governmental investment of pension funds in private sector investments, the trust funds of terminated pension funds being administered by the Pension Benefit Guaranty Corporation and the Thrift Savings Plan for federal employees.

The authors report that Malaysia and Singapore have allowed the provident funds and equivalent private plans to operate side by side, but that in practice most private plans have been absorbed into the provident funds. It would be helpful to know why most employers have elected to use the provident funds, and to consider designing a program that would encourage both programs to operate simultaneously. This has a parallel to the United Kingdom and Japan, which allow employers to contract out of the public program if they provide equivalent benefits. If contracting out is permitted, it would be logical also to allow contracting out by employers with defined benefit plans that provide equivalent benefits.

Contribution Rates, Benefit Levels and Rates of Return

James and Vittas's first table shows that a program that indexes pensions to inflation, that has a passivity rate (ratio of payout years to accumulation years) of one-third and a zero real rate of return requires contributions of 13 percent of pay to provide pensions of 40 percent of the final rate of pay, but would require contributions of 20 percent if the passivity rate were one-half. The United States social security system is fairly comparable, since workers who work 45 years and retire at age 65 have a passivity rate of about 1/2.5 and receive benefits that have a median of approximately 43 percent of pay (decreasing to about 37 percent for future retirees). Costs of the OASI (Old Age and Survivor Insurance) program are currently 10.2 percent of pay but are projected to increase to 16.1 percent in 75 years. Thus the benefits and costs of the OASI program are roughly comparable to the benefits and contributions shown for the mandatory savings scheme with a zero real rate of return. However, their Table 1 shows that, if the real rate of return can be increased to 2 percent, required contributions are cut approximately in half. Thus maximizing the rate of return within acceptable levels of risk is extremely important for the funded system.

Investment in Government Securities

James and Vittas state that, by investing in government securities, the provident funds receive lower returns and "can involve capital and labor market distortions and capricious redistributions similar to those in many public defined benefit plans." Lower returns are a natural concomitant of low risk securities, but investing in government bonds does not necessarily affect capital and labor markets significantly differently than investing in corporate bonds. While any significant economic program distorts capital and labor markets from what they would otherwise be, such distortions can have both positive and negative effects. In the United States, for example, the social security system has tended be a stabilizing factor in the economy, helping slightly to reduce the erratic swings in capital and labor markets. The redistributions of such programs are usually not capricious, but are intentional and carefully planned.

The trust funds of the United States social security system are invested in United States government securities, but this has little effect upon the total outstanding governmental securities. The total outstanding governmental securities must be sufficient to finance the excess of governmental expense over governmental income. If the social security system's trust funds were to switch from purchasing United States government bond to purchasing corporate bonds, the Treasury would merely have to sell more bonds in the public marketplace. The greater demand for corporate bonds and lower demand for governmental bonds would tend to decrease interest rates for corporate bonds and increase interest rates for government bonds. Greater investment returns of the social security system's trusts would reduce the cost of the social security system, but higher interest rates on government bonds would increase the general revenue expense. Thus by purchasing government bonds instead of private sector securities, social security systems and provident funds tend to subsidize general revenues.

However, the authors were not discussing this minor subsidy through interest rates, but rather the tendency of some governments actually to spend more because the provident funds provide the facility to finance government debt. The authors apparently believe that this facility has reduced a discipline that would otherwise restrain governmental spending in some countries, and I assume that there is a basis for this assertion. On the other hand, if government spending is required for development and other needs and if the government has limited ability to finance its debt, this facility may enable the government to make needed expenditures that it would not otherwise be able to make. In addition, financing part of the government's debt through the provident funds will help hold down the interest rate not only on the debt held by the provident fund

but on all the government's debt. Any government must balance the advantages and disadvantages of these approaches.

Other Investment Considerations

For privately managed investments, the authors point to the advantage of investing in foreign assets to provide diversification. This also introduces an exchange rate risk, particularly if there is a possibility that the currency of the investing country will generally become stronger in the future. This is not a reason to exclude foreign investments, but it is a consideration in deciding how extensive they should be.

The chapter describes the problems of decentralized private investment, which include malfeasance and the regulatory burden of attempting to control it, the additional expense resulting from individuals' switching back and forth between competing funds, and the charges for commissions and other selling costs. All such problems can be avoided by utilizing a single governmentally administered fund invested in private sector investments, the approach taken in the United States by the trust funds of terminated pension funds being administered by the Pension Benefit Guaranty Corporation and the Thrift Savings Plan for federal employees.

The Thrift Savings Plan invests in equities using the index fund method. This method not only reduces investment expenses but in most periods produces higher rates of return than most actively managed pension funds. It also removes the government from political considerations in making investment decisions. Some developing countries may lack a suitable index for this approach.

Because of the fungibility of assets, whether an additional dollar of retirement savings is invested in government bonds or private sector investments may have little effect on the allocation of capital. If the new dollar is invested in government bonds, that amount of bonds will not be purchased by other investors, who will then have one more dollar available for private sector investments. This will not be the case, however, if the purchase of government bonds causes the government to make more total expenditures and to issue more bonds.

The authors raise the specter of backdoor socialism if a governmental program controls private sector investments, and particularly if it exercises control through voting rights. This is usually not a problem with debt instruments. The problem can be avoided for equities if the government avoids voting its stock.

The authors list potential problems if employees are not permitted to make investment choices. In my opinion most employees would be better served by having diversified investments made either by professional

portfolio managers of a single fund or by the index method, resulting in better gross investment results and lower sales and administrative expenses.

Conclusion

Mandatory savings schemes can provide little retirement income for those who are close to retirement at the time the program is established. Therefore a universal defined benefit system is essential to meeting retirement income needs, at least until the mandatory savings scheme has been in effect for many years. Even then, the mandatory savings scheme will be ineffective in meeting retirement income needs to the extent it does not have the following characteristics:

- universal coverage;
- mandatory application of the account balances to provide a lifetime income for the retiree, and for the retiree's spouse if applicable;
- cost of living adjustments after the pension commences.

Even if a mandatory savings scheme is not fully effective because it does not completely meet these criteria, it may still be a very valuable supplement to the basic defined benefit program of a social insurance system. For the United States such an addition would help millions of workers achieve adequate retirement incomes and would substantially increase capital formation.

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